

**Claims**

It is claimed:

1. A microplate apparatus comprising:  
a microtiter plate defining an array of sample wells, each having exterior  
5 wall surfaces;  
a plate-handling machine having a plate-support surface and a sample-  
handling or reading device which operates on individual wells in said microtiter plate;  
a control unit for controlling the position of said device with respect to  
defined coordinates on said plate-support surface; and  
10 a locator structure comprising at least one projection extending from said  
plate-support surface, wherein each of said at least one projection engages said exterior  
wall surfaces of at least one but no more than four adjacent wells, when said microtiter  
plate is positioned on said plate-support surface, to fix the position of each well at a known  
location with respect to said defined coordinates,  
15 wherein one or more of said at least one projection and said exterior wall  
surfaces of one or more wells have complementary shaped regions, with said engaging  
taking place between said at least one projection and said complementary shaped regions  
of said wells when said microtiter plate is positioned on said plate-support surface.
2. The apparatus of claim 1, wherein said locator structure comprises  
20 two or more projections extending from said plate-support surface.
3. The apparatus of claim 1, wherein one or more of said at least one  
projection tapers on progressing toward their upper regions and said one or more wells

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taper on progressing toward their lower regions, with said exterior wall surfaces of said tapered wells defining one or more tapered recesses, each recess adapted to receive one of said at least one projection.

4. The apparatus of claim 1, wherein each of said at least one  
5 projection defines a central cavity formed at a distal end of each of said at least one projection, wherein said central cavity extends from said distal end of said projection toward said plate-support surface and opens away from said plate-support surface, said cavity being configured to receive at least a lower region of said exterior wall surfaces of a well.

10 5. The apparatus of claim 1, further comprising a biasing assembly operable to urge said exterior wall surfaces and said locator structure together, when said microtiter plate is positioned on the plate-support surface.

6. The apparatus of claim 5, wherein said biasing assembly includes a vacuum source and a flow line communicating said vacuum source with a lower side of  
15 said microtiter plate, when said microtiter plate is positioned on said plate-support surface, said vacuum source being operable to draw said microtiter plate against said plate-support surface.

7. The apparatus of claim 1, further comprising a movable support, to which said device is attached, said movable support adapted to transport said device  
20 toward and away from a position whereat said device can address and operate on individual wells fixed at said known locations.

8. The apparatus of claim 1, further comprising a positioning assembly adapted for communication with said control unit, and operably connected to said plate-

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support surface; said positioning assembly being operable, under direction of said control unit, to move said plate-support surface toward and away from a position whereat said sample-handling or reading device can operate on individual wells fixed at said known locations.

5                   9.       The apparatus of claim 1, wherein said device includes a plurality of sample-handling or reading members disposed in an array that is alignable with at least a portion of said array of sample wells, with said wells fixed at said known location.

                  10.       A microplate apparatus comprising:

                  a microtiter plate defining an array of sample wells, each having interior  
10 wall surfaces;

                  a plate-handling machine having a plate-support surface and an acting-member support with one or more sample-handling or reading members disposed therealong, each of said members being adapted to operate on an individual well in said microtiter plate;

15                   a control unit for controlling the position of said acting-member support with respect to defined coordinates on said plate-support surface; and

                  a locator structure depending from said acting-member support for engaging said interior wall surfaces of one or more wells, when introduced therein, to fix the position of one or more unengaged wells in alignment with said one or more members.

20                   11.       The apparatus of claim 10, wherein said locator structure and said interior wall surfaces have complementary shaped regions, with said engaging taking place between said complimentary shaped regions when said locator structure is inserted into one or more wells.

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12. The apparatus of claim 11, wherein said locator structure includes two or more elongate projections disposed in spaced relation along said acting-member support.

13. The apparatus of claim 10, wherein said plate-handling machine  
5 includes a plurality of sample-handling or reading members; and further wherein said members and said locator structure collectively define an array that is alignable with at least a portion of said array of sample wells.

14. The apparatus of claim 10, further comprising a biasing assembly  
operable to urge said interior wall surfaces and said locator structure together, when said  
10 locator structure is inserted into one or more wells.

15. The apparatus of claim 14, wherein said biasing assembly presses said acting-member support toward said plate-support surface, with said microtiter plate interposed therebetween.

16. A microplate apparatus comprising:  
15 a microtiter plate defining an array of sample wells, each having exterior wall surfaces;

a plate-handling machine having a plate-support surface and a sample-handling or reading device which operates on individual wells in said microtiter plate;

a control unit for controlling the position of said device with respect to  
20 defined coordinates on said plate-support surface;

a locator structure comprising at least one projection extending from said plate-support surface; and

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a central cavity formed at a distal end of each of said at least one projection, wherein said central cavity extends from said distal end of said projection toward said plate support surface and opens away from said plate-support surface, said cavity being configured to receive at least a lower region of said exterior wall surfaces of a well, when

5 said microtiter plate is positioned on said plate-support surface, to fix the position of each well at a known location with respect to said defined coordinates.

17. The apparatus of claim 16, wherein each of said central cavities of said at least one projection and said exterior wall surfaces of one or more wells have complementary shaped regions, with said engaging taking place between said central

10 cavities and said complementary shaped regions of said exterior wall surfaces of said wells when said microtiter plate is positioned on said plate-support surface.

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